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Abstract

Data on the age distribution of the labor force, by activity, appear in numerous early-twentieth-century European censuses; but they have been very largely neglected. This paper provides an initial examination of the age-distribution data in the Italian census of 1911, showing how they shed light on various aspects of the economy of the day, and on its preceding path. A point of particular interest is that these data reflect the long cycle in construction, and in the production of construction materials. They further suggest that the long cycle of the engineering industry documented by its aggregate metal consumption was indeed present in the production of construction-related hardware, but notably absent from the production of machinery and, derivatively, industrial investment. This last point denies the empirical premise of the extant interpretations of Italy's post-Unification industrial growth; but it sits well with the new disaggregated time-series estimates of the engineering industry's product.

JEL Classification: J11, J61, J62, N33, N63
Keywords: Demografic Trends; Geographic Labor Mobility; Job, Occupational, and Intergenerational Mobility; Manufacturing and Construction Europe: Pre-1913

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1. Introduction

The age distribution of the labor force, by activity, is documented by numerous early-twentieth-century European censuses, at times in considerable detail (e.g., for Belgium, Ministère de l'Intérieur 1915; for England and Wales, Census Office 1914; for France, Ministère du travail et de la prévoyance sociale 1915). A search of the literature that cites these sources suggests that they have been very largely neglected: one cannot prove a negative, but no systematic studies, at least by economic historians, could be found.

Italy is a case in point. The demographic censuses taken in Italy in 1861, 1871, 1881, 1901 and 1911 are among the most significant sources of data for the post-Unification period, not least because from 1871 on they contain detailed statistics on the distribution of the population by location, activity, age, and more (Direzione generale della statistica 1864-67, 1874-76, 1883-85, 1902-04, 1914-16); a significant literature has made use of these data to track the evolution of the labor force at both the national and the regional level (e.g., Vitali 1970; Zamagni 1987; Fuà and Scuppa 1988). The data on the activity-specific distribution of the labor force by age (and sex) are particularly rich in the 1911 census: where the preceding census of 1901 distinguished only three broad age groups, with the cutoffs at 15 and 65, the 1911 census distinguishes six categories, with cutoffs at 15, 21, 30, 45, and 65.[1] These particular data seem also never to have been studied in their own right, and even passing references seem few and far between (e..g., Fenoaltea 2015a, p. 229). In fact, however, they are of considerable interest, as they shed light on a number of features of the economy: in the census year itself, of course, but over the preceding decades as well.

This article has, accordingly, a threefold purpose. Most generally, it aims to call attention to these age-distribution data, and to their potential usefulness: in the Italian case, obviously, but at least by implication in other empirical contexts as well. Specifically, it seeks to establish their credentials as indicators both of the (Italian) economy's then current features, and of its past history. Even more specifically, as a case study of particular import, it draws out their implications for the long cycle in capital formation. That cycle is well known, and its accepted features underpin the extant interpretations of Italy's post-Unification growth; the age distribution of the labor force in 1911 strongly suggests that those features have been widely misunderstood, and that all the proposed analyses rest on a flawed empirical premise.

The article proceeds by examining the age composition of the labor force from four successive standpoints; following a by now established tradition, the data considered here refer only to the males of working age, by economic activity (or inactivity).[2] The first two analyses involve interregional comparisons of the entire (male) population or labor force. On the one hand, the local age distribution of the male population seems closely tied to the local incidence of emigration; on the other, the differences in the labor-force participation rates of the youngest groups seem tied to the structure of the local economy, and its impact on the choice between work and schooling.

The other two analyses involve intersectoral comparisons of the national labor force. One notes that the age profile seems normally dominated by the nature of work, and the

[1] There is also a lower bound, set at age 10, up from 9 in 1901.

[2] These are the data presented, by region and for the entire Kingdom, in vol. 5 of the 1911 census. Women are neglected because of the well-known unreliability of their classification either as housewives or as (possibly occasional) industrial workers; see, e.g., Ciccarelli and Fenoaltea (2013).

varying requirement for physical strength, but with some noteworthy exceptions tied to the industry's past history. The long (Kuznets) cycle in construction is solidly established; the comparative lack of middle-aged men in the construction and construction-materials industries appears to reflect the relative reduction of recruitment when construction was in the throes of extended depression.

The other is the case study of the engineering industry: examining the various components of that sector one finds evidence of a long depression in those that produced hardware for the construction industry, but not in those that produced machinery. The age-distribution data thus contradict the long-held belief that machinery production and investment in industry also followed the long swing -- and dovetail nicely with the disaggregated engineering-industry production series newly compiled by Stefano Fenoaltea (Fenoaltea 2015b).

2. Interregional comparisons: the age distribution of the male population of working age

Figure 1 illustrates, at the national level, the percentage share of the "males present" in each of the age classes. The profile reflects of course the varying breadth of the individual classes; dividing the class total by its span of years one obtains a smoothly declining profile (with per-year averages equal successively to 372 - 310 - 247 - 189 - 148 and finally 111 thousand, assuming a ten-year span for the senior category), as one would expect of a society that had not yet completed its demographic transition.

Figure 2 illustrates an index of each region's age structure, calculated for each class simply as the ratio of its percentage of the within-region total to the corresponding percentage of the national total illustrated in Figure 1. Significant differences in the region-specific profiles are immediately apparent: some are practically flat, implying an age distribution much like the national one, others notably humped, or U-shaped, implying respectively supernormal, or subnormal, numbers in the central age groups. Since emigrants are notoriously dominated by young adult males, the profiles in Figure 2 speak to the local incidence of migration -- in 1911 itself, obviously, but over the preceding years and decades as well. A convenient summary indicator of each region's relative profile is simply the local share of males in the central age groups, from 15 to 44, reported in Table 1, col. 1: a relatively high share in col. 1 points to lower-than-average emigration (or even net immigration); a relatively low one, to higher-than-average emigration. The region-specific rates of net migration over the decade to 1911 (Di Comite 1983, p. 509) are transcribed in Table 1, col. 2.

Not surprisingly, the relative number of young adult males is highest in Liguria, Lombardy, and Latium, the three regions with the (algebraically) lowest decadal rate of net emigration. In Figure 2 Liguria and Lombardy display similar profiles, with super-normal numbers of men aged 30-44, and even more aged 22-29; Latium displays a profile with (in relative terms) a similar peak number of men in their twenties, but with fractionally more aged 45-64 than aged 30-44, a reflection surely of the influence on migration into the city of Rome of the violent building boom that saw construction treble over the 1880s, and fall right back over the 1890s (Ciccarelli and Fenoaltea 2009, Table B.001).

The relative number of young adult males is conversely lowest in the Abruzzi, Calabria, and Basilicata, the three regions with the *highest* decadal rate of net migration: in Figure 2 all three display a sharply V-shaped profile, with a minimal (relative) number of

males in their 20s. Venetia's profile is also V-shaped, but with a minimal (relative) number of males aged 45-64, an oddity tied no doubt to the sharp drop in the region's rate of net emigration from around the turn of the century (Di Comite 1983, p. 509)

Different sorts of outliers appear at a finer level of detail. In Apulia and Sicily, in particular, the profile in Figure 2 is practically flat, indicating a distribution virtually identical to that of Italy as a whole, save for a markedly below-average share of senior males. Both these regions had grown rapidly, in demographic terms, since Unification, so an episode of strong emigration in the distant past can be ruled out; one can surmise that what we see here may be the effect of local morbidity and mortality, but a proper investigation of the issue is beyond the scope of the present paper.[3]

The young-adult-male-share and decadal-net-migration figures in Table 1, cols. 1 and 2 yield the scatter diagram in Figure 3. The two statistics are, as expected, closely related (r = -.89); indeed, the only observation well off the dominant curvilinear association pertains to Basilicata, with much the highest rate of net emigration over the preceding decade (almost 13 per thousand), but far from the lowest share of males aged 15 to 44 (about .50, against .45 in the Abruzzi). Pending further research which is again beyond the scope of this paper, the fact that Basilicata retained more males aged 15 to 45 in 1911 than one would have expected on the basis of its relative net migration since 1901 suggests that 1911 itself may have been in relative terms an exceptionally good year (for local employment) in an otherwise bleak decade; one notes in this connection the unprecedented local boom in construction associated with the Apulian aqueduct (Ciccarelli and Fenoaltea 2009, Table B.001 and associated text).

3. Interregional comparisons: the age-specific labor-force participation of the male population

Table 2 reports, in the first line, the national class-specific labor-force participation rates: a little over half for the youngest group (10-15), 90 percent for the next (15-21), just short of 100 percent, as one would expect, from age 21 to 65, and still around 80 percent for the senior group. The region-specific lines report the relative deviations of the local class-specific participation rates from the corresponding national averages: a figure of .10 for the first category indicates a participation rate 10 percent higher than the national mean of 53 percent, that is, a participation rate just over 58 percent (and not 63 percent, as the deviations are relative and not absolute).

Within the groups of prime working age, from 21 to 65, pretty much everyone worked pretty much everywhere, and the local deviations from the national averages range from zero to just (plus or minus) three percent.

Much larger deviations from the national average appear in the first age group, aged 10 to 15, where the alternative to work was presumably study. One notes three broad classes of regions. In four, relatively few boys were working: Liguria above all, with a participation rate just 70 percent of the national average, and then, at a distance, Latium, Lombardy, and Piedmont (all at 85 to 90 percent of the norm). On this measure too, the

[3] The senior group was underrepresented in Lombardy and Sardinia too, but the overrepresentation there of men between 21 and 45 clouds the issue. On Apulian and Sicilian demographic growth see Fenoaltea (2011), Table 6.02. For what it may be worth the share of young men declared unfit for military service was relatively high in Apulia (48 percent) and Sicily (47 percent) -- surpassed only by Sardinia (63 percent), and followed, perhaps surprisingly, by Lombardy (45 percent). See Direzione generale della statistica (1912), plate following p. 40.

presence of the capital lifted Latium into rough parity with the industrial leaders of the Northwest (e.g., Felice 2011, Table 1). The boys' participation rate was within 5 percent of the national average in most of the Center-Northeast (Venetia, Emilia, Tuscany, the Marches, Umbria), in Campania in the continental South, and also, perhaps surprisingly, in both major islands, Sicily and Sardinia. A high participation rate, 15 to over 20 percent above the national average, was observed in the remaining regions of the continental South: in ascending order the Abruzzi, Basilicata, Calabria, and Apulia. What is striking here is the difference between Sicily and Apulia, two regions of the South that otherwise appear to have much in common, from a concentration in specialized agriculture (citrus, vines) to rapid (demographic and presumably overall) economic growth, surpassed only by Liguria's: it is tantalizing, but once again it cannot be pursued here.[4]

Statistically, and again not surprisingly, the region-specific relative deviations from the national average participation rate for this youngest age group display a strong positive correlation with the (corresponding deviations from the national average of the) local shares of employment in agriculture and light industry (census categories 2, 4, and 7), which employed significant numbers of children (r = .89), a strong negative correlation with those in heavy industry (census categories 2, 4-5, 7, and 8.1-8.2), which did not (r = -.91), and a weaker negative correlation with those in the services (census categories 8.3-8.4, 9-10; r = -.75). Allowing for these gross distinctions, the outliers reduce to three, the Marches and even more so Apulia on the up-side, and Umbria (the home of the Terni steel-works) on the down-side.[5] Allowing for the structure of the local economy, the four regions where relatively few boys worked -- the three Northwestern industrial leaders, Latium with the national capital -- all display youthful participation rates close to the norm. There is no evidence of a local preference for keeping children in school, for accumulating human capital: there is no evidence that these (in the Italian context) relatively advanced *economies* were also, from this point of view, relatively advanced *societies*.

4. Interindustry comparisons: the age distribution of the male labor force

We turn now to the age structure of the male labor force not by region but, at the national level, by industry.

That structure can be expected to vary as a function of at least three factors. The first and most obvious reflects the nature of the work itself: where it demands physical strength one would expect a concentration in the central age groups, where it does not one would expect a correspondingly disproportionate number of boys or older men. The second is tied to technological progress. A "new" industry would be expected to employ few older men, as it may not even have existed when they were choosing their trade; conversely, a dying industry would not attract the young, and continue to employ only those too old to contemplate retraining (one recalls here the cotton industry, marked by the golden age of the

[4] On the relative performance of Sicily and Apulia see for instance Fenoaltea (2011), pp. 208-209; also Ciccarelli and Fenoaltea (2013).

[5] Since the shares of the three identified sectors (agriculture and light industry, heavy industries, services) sum to unity, the youth-participation-rate-deviations in Table 2, col. 1 can be regressed indifferently on the corresponding labor-force-share deviations of any two of the three sectors; the residuals are invariant to that choice. The outliers noted in the text are the regions with a residual exceeding the standard error of the regression.

hand-loom weavers which was ushered in by the mechanization of spinning and suddenly ended when weaving was also mechanized).

A third and subtler factor has to do with the industry's cyclical path. The census data refer to 1911, obviously, but the age distribution is tied to the industry's past. The youngest group, of youths who just entered the labor force, is clearly made up of recent recruits. Older workers may have joined the labor force later in life, or moved from one industry to another; but these can be presumed to be exceptions. The norm, the desired career path, involves an early investment in mastering a trade, and then reaping the return, including the productivity gains that come with experience. As the demand for labor shifts from one industry to another the adjustment seems to come on the one hand by shifting unskilled labor -- the omnipresent fetchers and carriers, whose numbers increase when the skilled are under pressure to concentrate on processing proper, and symmetrically decrease in slack times -- and on the other, even more spontaneously, by redirecting the flow of new entrants to the industries that are actively recruiting. A cyclical industry that passes suddenly from rapid growth to rapid decline will lose skilled workers too, but surely the *least* skilled, those with the least experience and the smallest investment in their own training: the youngest workers, the more recent recruits. "Last in, first out" is not just an accounting practice, or a union rule: it is the very logic of the market-place.

The age distribution of an industry's labor force thus sheds light on its past performance. Assuming for simplicity that boys entered the labor force between ages 10 and 15, those aged 21 to 30, for example, would have been recruited between 1891 (a 30-year-old recruited at 10) and 1905 (a 21-year-old recruited at age 15). In general, therefore, those aged 10 to 15 can be presumed to have been recruited over a number of years centered approximately on 1908, and so on for the older cohorts: 21 to 30, ca. 1898, as illustrated; 30 to 45, ca. 1886; 45 to 65, ca. 1869; and 65 plus, say ca. 1854. As good luck would have it, this periodization sits well with the long swing that dominated industrial and GDP growth, marked by slow growth in the 1860s and 1870s, a sharp acceleration to a peak in the later 1880s, decline and slow recovery through the turn of the century, and a renewed boom over the decade to 1911 (Fenoaltea 2011, pp. 40-47). As noted, however, it must be borne in mind that the numbers relate not to the gross recruits of each period, but the *net* recruits, those that did not leave the industry during whatever cyclical decline it experienced after they joined it.

Figure 4 illustrates the age distribution of the labor force for all industry (census categories 2-7, 8.1-8.2); it is analogous to Figure 1. Figure 5 is in turn analogous to Figure 2: it illustrates an index of each industry's age structure, calculated for each class simply as the ratio of its share of the specific industry's labor force to its corresponding share of the all-industry total illustrated in Figure 4.

A number of graphs are much as one would expect, given in particular the nature of the work involved. The light industries, in particular, are broadly "U-shaped," with super-normal numbers of less-than-fully-able-bodied boys and older men: thus both census category 3 (industries working vegetable or animal products other than textiles), and category 6 (textiles). Some heavy (and at times relatively "new") industries, too, display a profile with a notable hump, corresponding to super-normal numbers of fully-able-bodied men: thus census category 2 (mining and quarrying), category 7 (chemicals), and categories 8.1-8.2 (printing and publishing, utilities). But not all: category 4 (the metal-processing industries, metalmaking and engineering) displays only a relatively moderate hump, category 5 (non-metallic mineral products, essentially construction materials, and

construction) actually displays an *inverted* hump, quite at odds with what the heavy labor it involves would lead us to expect.

The peculiar age profile of the construction and construction-materials industries is explained, it would seem, by the industry's violent long cycle, marked by a strong upswing from the late 1870s to the later 1880s, and another from 1896 to 1911 -- and, in between, a depression so severe that construction in 1896 was over 30% below that at the 1886 peak, and so long that that peak was not surpassed until 1906, a full twenty years later.[6] If the industry's cyclical profile is taken into account it comes as no surprise that the age profile in 1911 should reveal a comparative lack of recruits in the depths of the depression (the 21-to-30 cohort in 1911, from the 1890s), and a lack of *surviving* recruits from the initial boom (the 30-to 45 cohort in 1911, from the 1880s).

The metalmaking and metal-consuming industries experienced a similar aggregate cycle, and it seems equally capable of explaining the (limited) flattening of the profile's central hump; but the sector warrants a closer look.[7] Figure 6, analogous to Figure 5, illustrates the age profile of the two-digit components of category 4, respectively 4.1 (ferrous metalmaking), 4.2 (non-ferrous metalmaking), 4.3 (fabricated metal, essentially hardware), 4.4 (machinery and equipment), and 4.5 (a hodge-podge that includes some hardware, some machinery, and precious-metal products too). These profiles are very different. The two metalmaking industries (categories 4.1 and 4.2) display the typical profile of heavy industry, with a strong central hump, as does the machinery industry (category 4.4) and also, to a lesser extent, the mixed group (category 4.5). The anomalous component is the large hardware industry, with a massive overrepresentation of recent recruits (over the ongoing boom), and an underrepresentation of those in the higher age groups to age 45, presumably as a result, as in the case of construction and construction materials, of a long preceding depression. The 1911 census evidence on the age distribution of the labor force thus suggests that the long cycle that dominated the Italian economy from Unification to the Great War was one shared by the construction and construction-materials industries, and also, within the metal-processing group, by the hardware industry -- also tied to construction -- but not, notably, by the machinery industry.

This result undercuts the entire postwar literature on the period at hand (Fenoaltea 2011, ch. 1, 2016). Alexander Gerschenkron had established the long swing in metal consumption, in the product of the engineering industry ("the machinery industry"); and the long cycle in machinery production and (derivatively) industrial investment became a universally accepted stylized fact. Gerschenkron himself dismissed the upswing of the 1880s as a false start, and placed Italy's industrial take-off in the upswing from the later 1890s to 1908; Rosario Romeo preferred to place the take-off in the earlier upswing; Franco Bonelli and Luciano Cafagna put the two upswings on a par, as components of a "slow and difficult take-off"; Stefano Fenoaltea also placed them on a par, but as mere upswings in an ordinary investment cycle; Pierluigi Ciocca, Emanuele Felice, Gianni Toniolo and Giovanni Vecchi have recently revived Gerschenkron's emphasis on the exceptional nature of the later upswing (Fenoaltea 2017; see Gerschenkron 1955, Romeo 1959, Bonelli 1978, Cafagna

[6] Fenoaltea 2011, Table 1.03. The long cycle in construction is undisputed, as it is solidly established by very direct evidence for all of its significant components; see Fenoaltea (2015c).

[7] Metalmaking is much the smaller component of the combined group; it too experienced a marked contraction after its late-1880s peak, but output declined for only three years, and a new high was reached within a decade.

1983, Fenoaltea 2011, ch. 2, Ciocca 2007, Toniolo 2013, Felice and Vecchi 2015). The interpretations of the economy's growth path differ from author to author, but all sought to explain how and why the 1880s and/or the early 1900s were marked by supernormal growth not just in industry's *product*, but in industry's capital stock and *capacity to produce*: why Italy's *industrialization* proceeded smartly then, and not in other decades. The evidence on the age distribution of industry's labor force in 1911 is consistent with the long cycle in construction and related hardware, but *not* consistent with a long cycle in machinery production and industrial investment: this is, in terms of the literature, a revolutionary result.

But it is not unprecedented. Fenoaltea has very recently reconstructed the engineering-industry production series, by components; and the very different evidence which shapes his estimates also forces the conclusion that the long cycle in "engineering" was in essence a long cycle in the production of hardware, tied directly to, indeed part of, the long cycle in construction, whereas the production of machinery (and therefore business investment) instead increased relatively regularly year after year, with no trace of the long cycle that dominates the engineering aggregate (Fenoaltea 2017). The labor force age-distribution data in the 1911 census and the new production series appear nicely to corroborate each other.

5. Conclusion

Various European censuses taken on the eve of the Great War contain data on the age distribution of the labor force, activity by activity. These data appear to have been very largely neglected: perhaps unwisely, for an initial examination of the data in Italy's 1911 census suggests that they are rich in current, and retrospective, economic content.

In the Italian case, the interregional differences in the age structure of the male population appear tied to the incidence of migration, those in the labor force participation of school-age boys to the structure of the local economy. Interindustry differences in the age structure of the male labor force correspond in the main to the need, or lack of need, for physical strength; the (from this point of view) anomalous age distribution of the construction and construction-materials industries appears to reflect the relative lack of recruitment during the long cyclical depression that spanned the 1890s and more.

Most interestingly, within the engineering group the hardware industry displays a profile similar to that of the construction-related industries, the machinery industry the "normal" profile typical of heavy industry, with no trace of a long cycle. This last result runs counter to a long literature: but it sits well with the newly compiled engineering-industry time series, which similarly attribute the long cycle to the hardware industry but not to the machinery industry (nor, derivatively, to industrial investment). Those results, and these, are independent; both gain strength from their agreement.

REFERENCES

Bonelli, F. (1978). "Il capitalismo italiano. Linee generali di interpretazione," in R. Romano and C. Vivanti, eds., *Storia d'Italia. Annali, 1. Dal feudalesimo al capitalismo* (Turin: Einaudi), pp. 1193-1255.

Cafagna, L. (1983). "La formazione del sistema industriale: ricerche empiriche e modelli di crescita," *Quaderni della Fondazione G. G. Feltrinelli* 25, pp. 27-38.

Census Office (1914). *Census of England and Wales*, *1911. Vol. X. Occupations and Industries. Part I.* (London: H.M.S.O.).

Ciccarelli, C., and Fenoaltea, S. (2009). *La produzione industriale delle regioni d'Italia, 1861–1913: una ricostruzione quantitativa*. *1. Le industrie non manifatturiere* (Roma: Banca d'Italia).

Ciccarelli, C., and Fenoaltea, S. (2013). "Through the magnifying glass: provincial aspects of industrial growth in post-Unification Italy," *Economic History Review* 66, pp. 57-85.

Ciocca, P. (2007). *Ricchi per sempre? Una storia economica d'Italia (1796-2005)* (Turin: Bollati Boringhieri).

Di Comite, L. (1983). "L'emigrazione italiana nella prima fase del processo transizionale," *Giornale degli Economisti e Annali di Economia* n.s. 42, pp. 507-517.

Direzione generale della statistica (1864-67). *Statistica d'Italia. Popolazione. Parte I. Censimento generale. (31 dicembre 1861.)* (Firenze: Barbera, 1867) and *Statistica del Regno d'Italia. Popolazione. Censimento generale (31 dicembre 1861)*, 3 vols. (vols. 1-2, Torino: Tip. Letteraria, 1864-65; vol. 3, Firenze: Tip. letteraria e degli stranieri, 1866).

Direzione generale della statistica (1874-76). *Popolazione. Censimento 31 dicembre 1871*, 3 vols. (vol. 1, Roma: Stamperia Reale, 1874; vol. 2, Roma: Tip. Cenniniana, 1875; vol. 3, Roma: Regia Tipografia, 1876).

Direzione generale della statistica (1883-85). *Censimento della popolazione del Regno d'Italia al 31 dicembre 1881*, 3 vols. in 4 tomes (vol. 1, parte 1, Roma: Tip. Bodoniana, 1883; vol. 1, parte 2, Roma: Botta, 1883; vols. 2-3, Roma: Tip. Bodoniana, 1883-84) and *Relazione generale e confronti internazionali*. (Roma: Botta, 1885).

Direzione generale della statistica (1902-04). *Censimento della popolazione del Regno d'Italia al 10 febbraio 1901*, 5 vols. (Roma: Bertero).

Direzione generale della statistica (1912), *Annuario statistico italiano 1911* (Roma: Bertero).

Direzione generale della statistica (1914-16). *Censimento della popolazione del Regno d'Italia al 10 giugno 1911*, 7 vols. (Roma: Bertero).

Felice, E. (2011). "Regional value added in Italy, 1891–2001, and the foundation of a long-term picture," *Economic History Review* 64, pp. 929-950.

Felice E. and G. Vecchi G. (2015), "Italy's growth and decline, 1861-2011," *Journal of Interdisciplinary History* 45, pp. 507-548.

Fenoaltea, S. (2011). *The reinterpretation of Italian economic history: from Unification to the Great War* (New York: Cambridge University Press).

Fenoaltea, S. (2015a). "Industrial employment in Italy, 1911: the burden of the census data," *Rivista di storia economica* 31, pp. 225-246.

Fenoaltea, S. (2015b). "The measurement of production movements: lessons from the general engineering industry in Italy, 1861-1913," *Explorations in Economic History* 57, pp. 19-37.

Fenoaltea, S. (2015c). "Italian industrial production, 1861-1913: a statistical reconstruction. K. The construction industries," *Carlo Alberto Notebooks,* n. 422 (Moncalieri).

Fenoaltea, S. (2017). "The fruits of disaggregation: the engineering industry, tariff protection, and the industrial investment cycle in Italy, 1861-1913," *Banca d'Italia – Economic History Working Papers* 41 (in press)

Fuà, G., and Scuppa, S. (1988). "Industrializzazione e deindustrializzazione delle regioni italiane secondo i censimenti demografici 1881–1981," *Economia Marche* 7, no. 3, pp. 307–327.

Gerschenkron, A. (1955). "Notes on the rate of industrial growth in Italy, 1881-1913," *Journal of Economic History* 15 (1955), pp. 360-375.

Ministère de l'Intérieur (1915). *Statistique de la Belgique. Population. Recensement général du 31 décembre 1910 publié par le Ministre de l'Intérieur. Tome IV*. (Bruxelles: Weissenbruch).

Ministère du travail et de la prévoyance sociale (1915). *Statistique générale de la France. Résultats statistiques du recensement général de la population effectué le 5 mars 1911. Tome I -- Deuxième partie. Population présente totale* (Paris : Imprimerie nationale).

Romeo, R. (1959). *Risorgimento e capitalismo* (Bari: Laterza).

Toniolo, G. (2013). "An overview of Italy's economic growth," in Id., ed., *The Oxford handbook of the Italian economy since Unification* (New York: Oxford University Press), pp. 3-36.

Vitali, O. (1970). *Aspetti dello sviluppo economico italiano alla luce della ricostruzione della popolazione attiva* (Rome: Istituto di Demografia dell'Università di Roma).

Zamagni, V. (1987). "A century of change: trends in the composition of the Italian labor force, 1881–1981," *Historical Social Research* 44, no. 1, pp. 36–97.

Table 1: The age distribution of the male population

	(1) Males aged 15 to 44: share of all males, 1911[a]	(2) Rate of net migration, 1901-1911[b]
Piedmont	.546	-4.48
Liguria	.585	2.74
Lombardy	.570	-.86
Venetia	.536	-5.88
Emilia	.541	-3.57
Tuscany	.538	-4.74
Marches	.502	-8.81
Umbria	.510	-7.78
Latium	.568	-1.57
Abruzzi	.445	-11.35
Campania	.513	-4.99
Apulia	.545	-3.62
Basilicata	.498	-12.92
Calabria	.481	-9.69
Sicily	.547	-5.59
Sardinia	.566	-4.21

[a]males under 10 are excluded from the total.
[b]average annual rate per thousand.

Source: see text.

Table 2: Labor-force participation of the male population

	(1)	(2)	(3)	(4)	(5)	(6)
age group:	10-14	15-20	21-29	30-44	45-64	65+
National rates:	.53	.90	.96	.97	.94	.81
Regional rates: relative deviations from national rate						
Piedmont	-.09	.02	.02	.01	.01	.01
Liguria	-.30	-.03	.01	.00	-.03	-.12
Lombardy	-.13	.03	.02	.02	.01	-.01
Venetia	.04	.04	.02	.01	.02	.03
Emilia	-.04	.02	.01	.01	.01	-.02
Tuscany	-.01	.00	.01	.00	-.01	-.05
Marches	.02	.01	.00	.00	.01	.03
Umbria	.04	.01	.01	.00	.01	.05
Latium	-.14	-.05	-.03	-.01	-.01	-.08
Abruzzi	.15	.03	-.01	-.01	.01	.10
Campania	-.01	-.05	-.03	-.02	-.02	.00
Apulia	.22	.00	.00	.00	.01	.01
Basilicata	.18	.01	.00	.00	.01	.00
Calabria	.20	.00	-.02	-.02	-.01	.05
Sicily	.01	-.06	-.03	-.02	-.02	.00
Sardinia	.01	.01	.00	-.01	.00	-.01

Source: see text.

Figure 1 - Males of working age present in 1911, by age class.

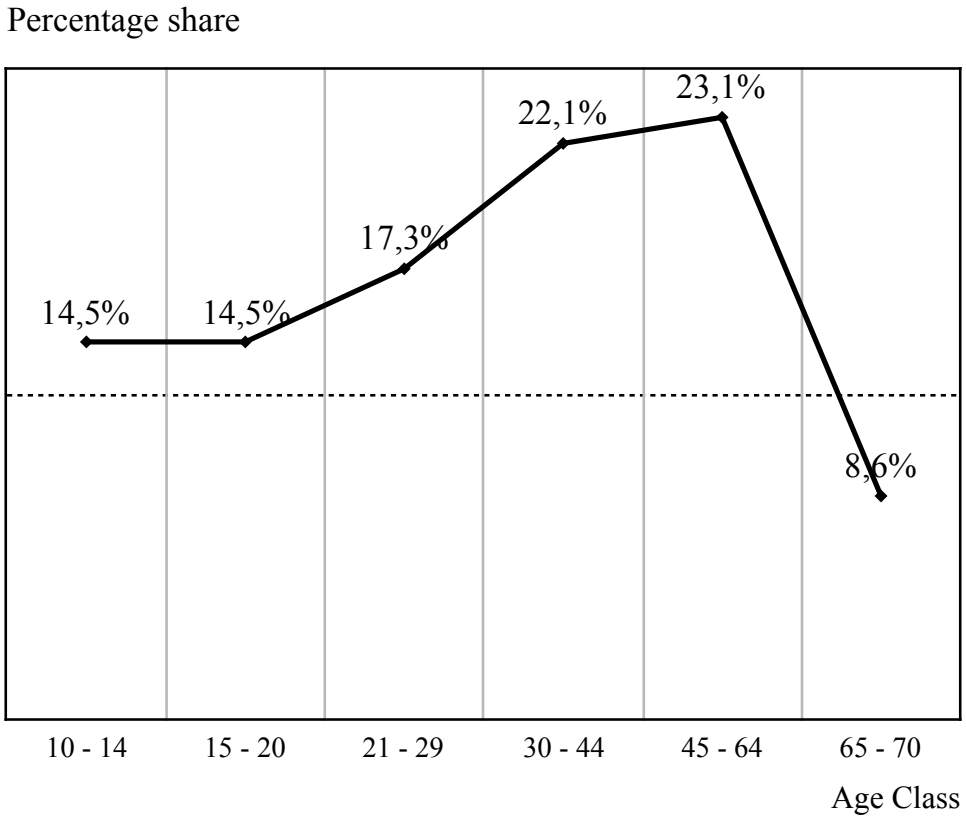
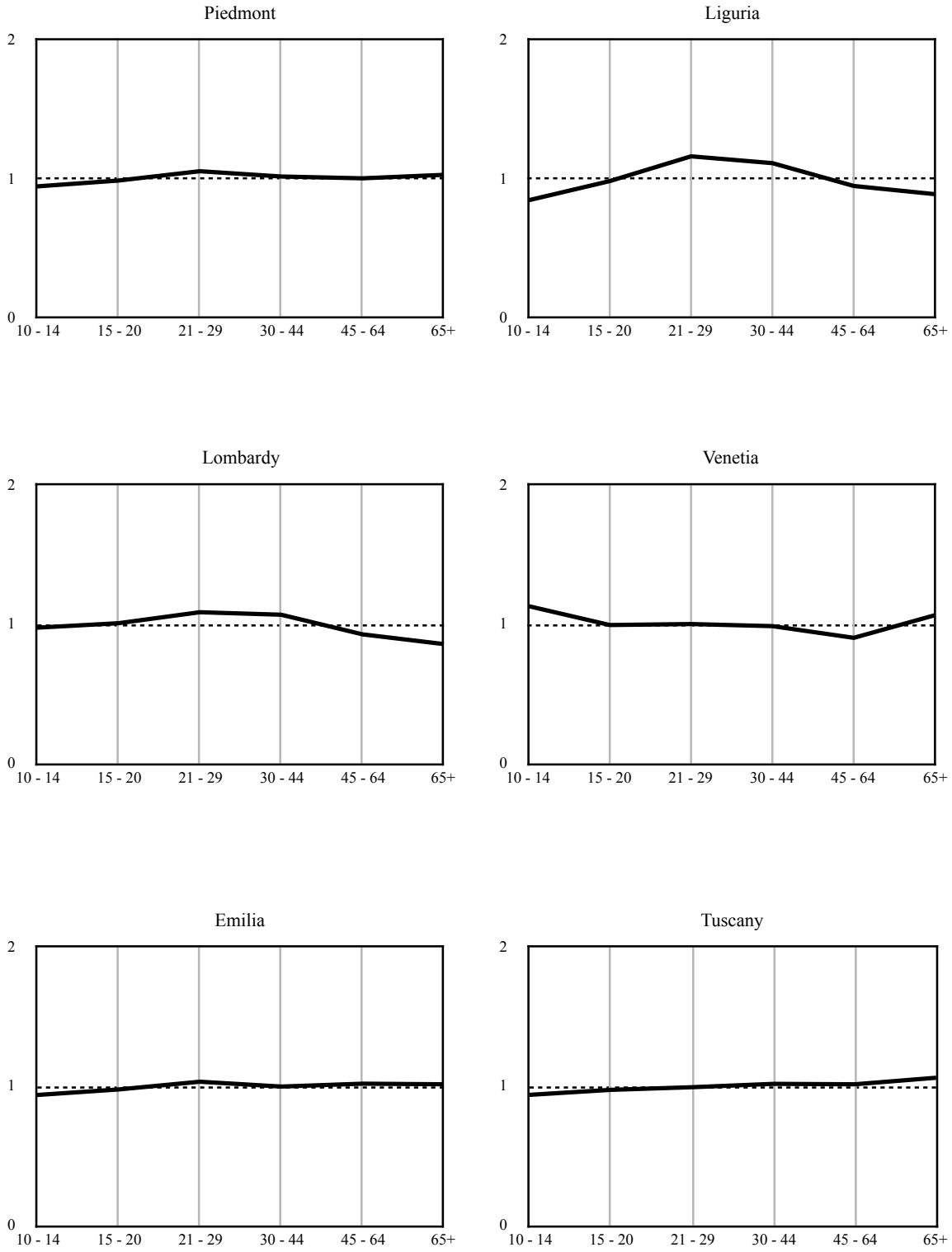
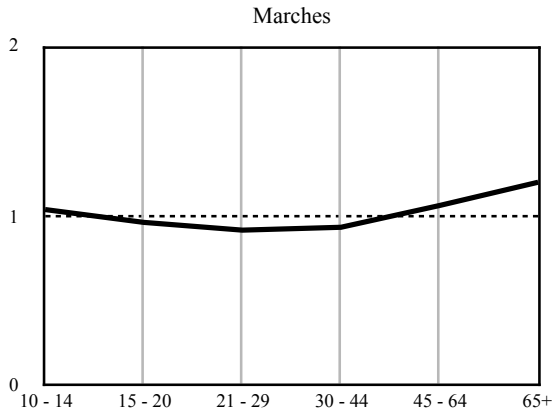
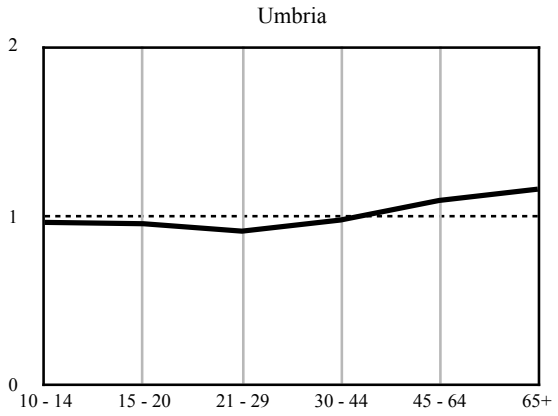
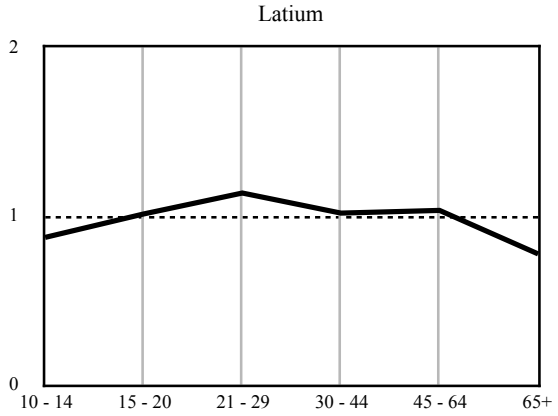


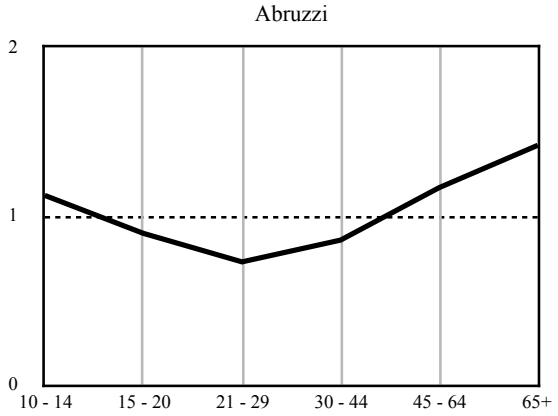
Figure 2 - Relative regional age structure.

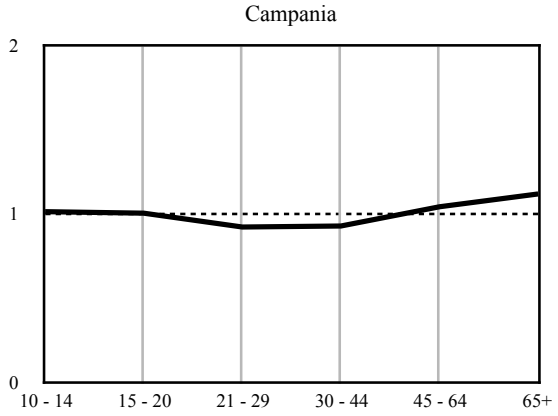


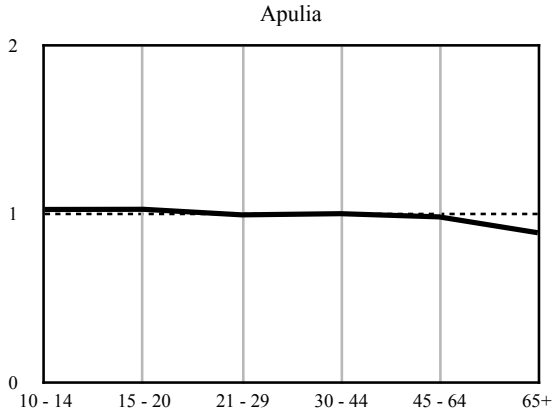

Marches
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+

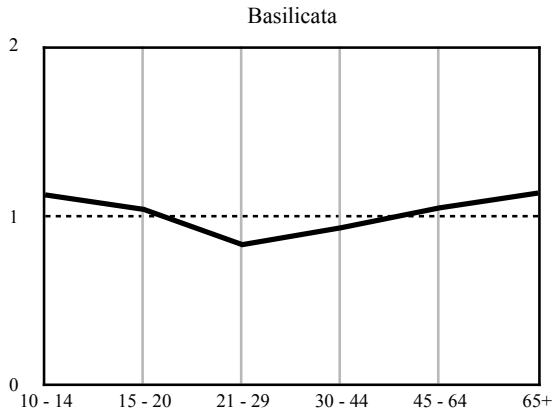

Umbria
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+

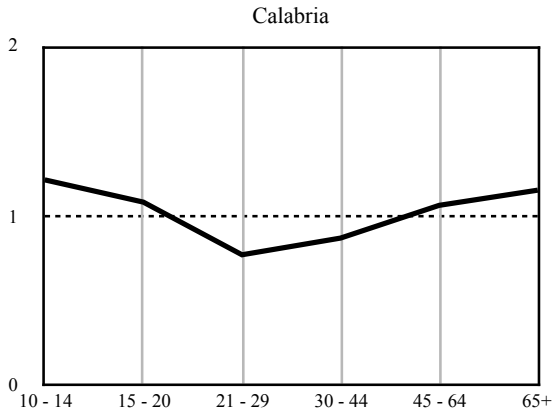

Latium
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+

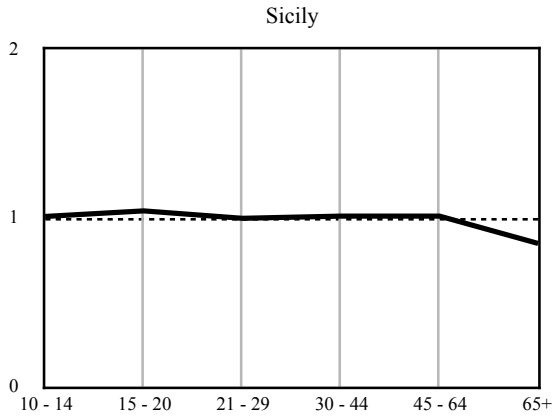

Abruzzi
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+


Campania
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+


Apulia
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+


Basilicata
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+


Calabria
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+


Sicily
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+

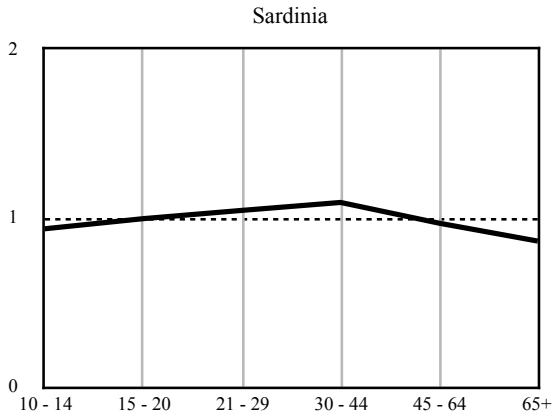

Sardinia
2
1
0
10 - 14
15 - 20
21 - 29
30 - 44
45 - 64
65+

Figure 3 - Age structure of the male population and net emigration.

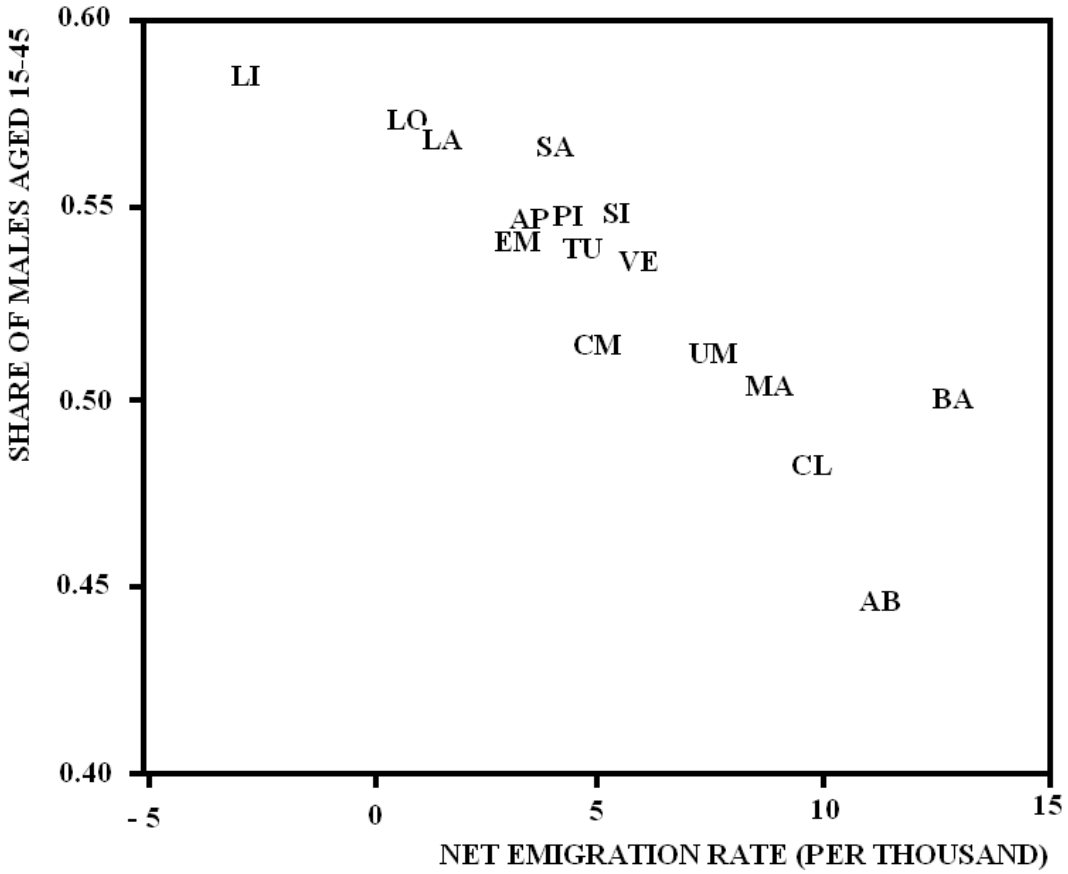


Figure 4 - Labor force of all industry, by age class.

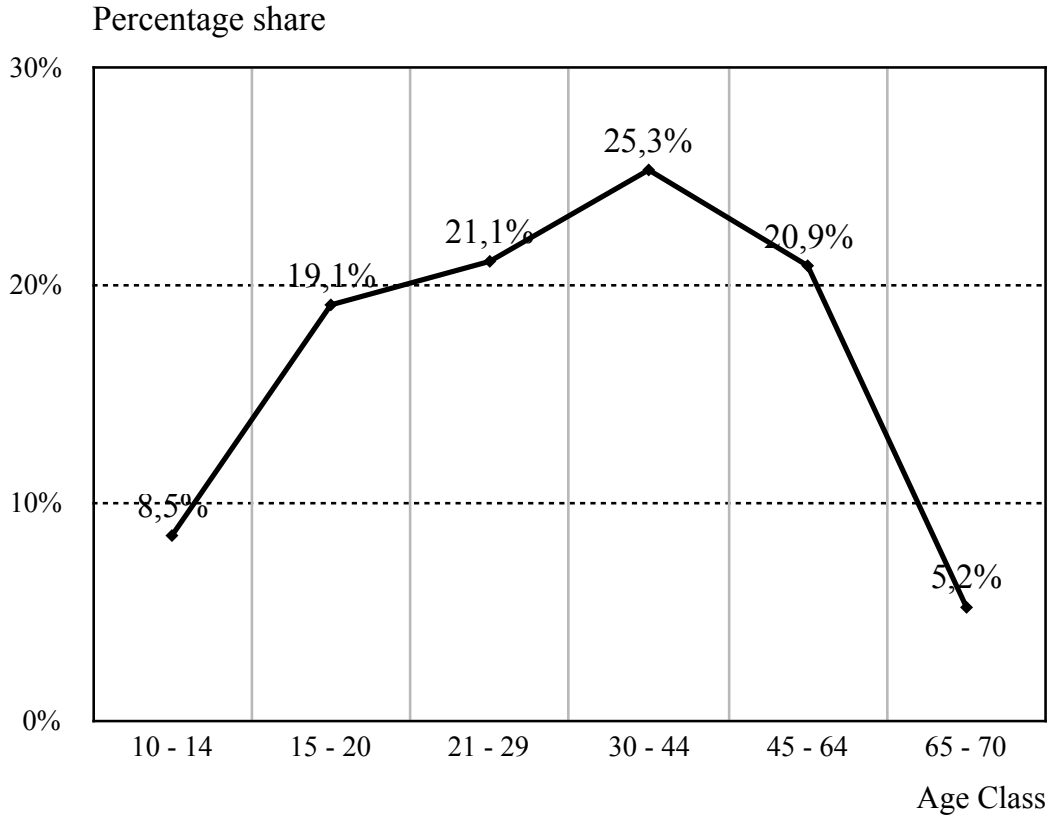
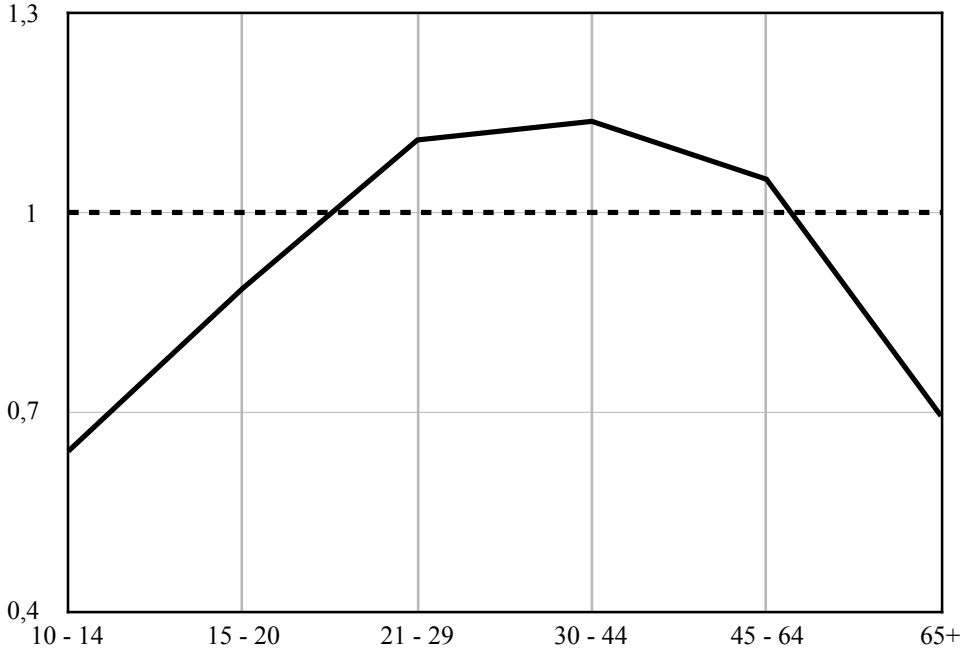
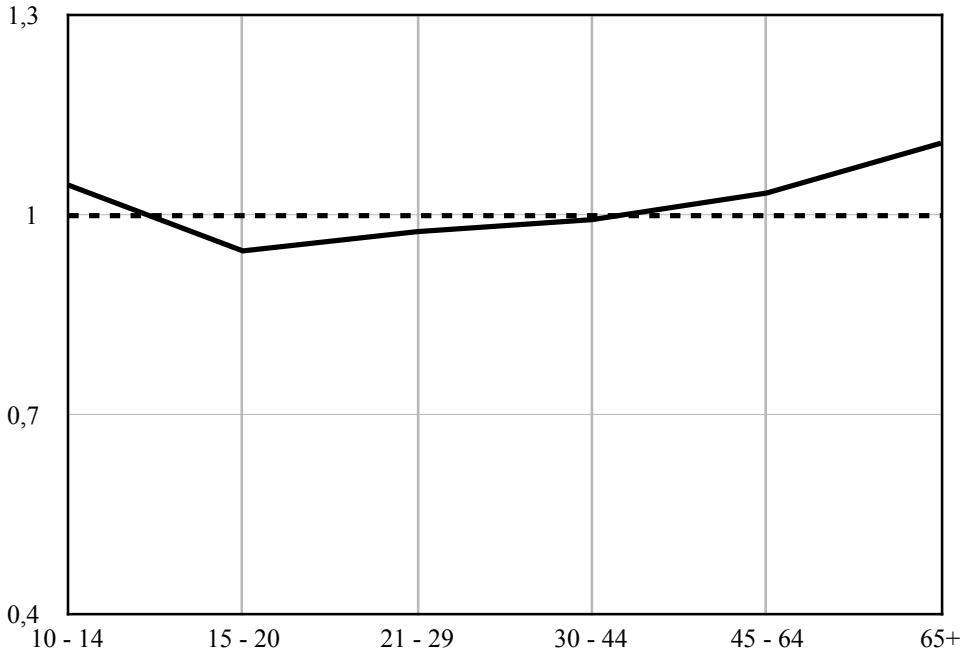


Figure 5 - Relative age structure, one-digit industries.

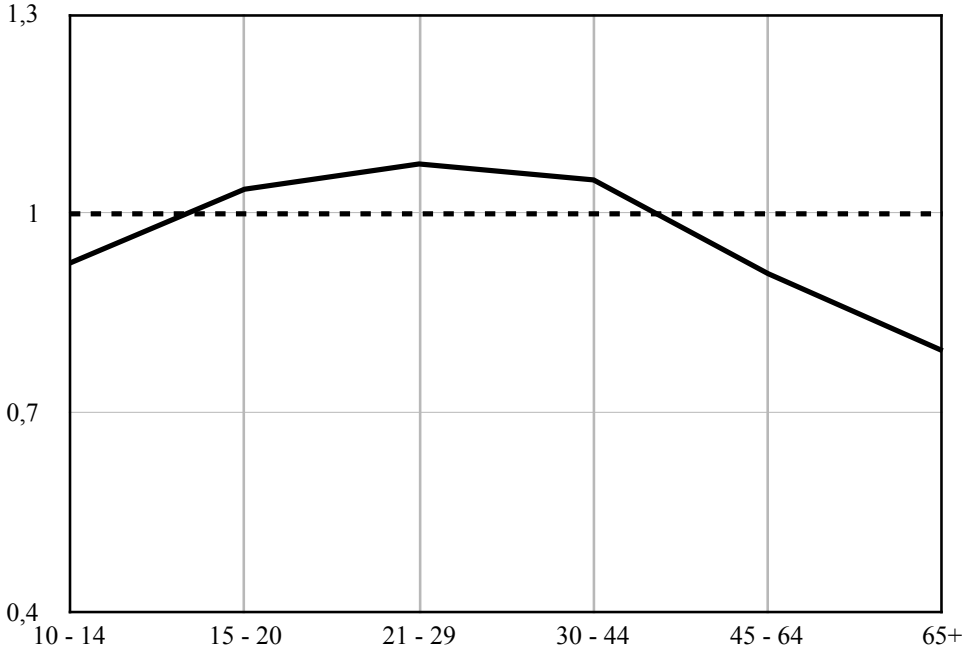
Category 2: Mining and quarrying.



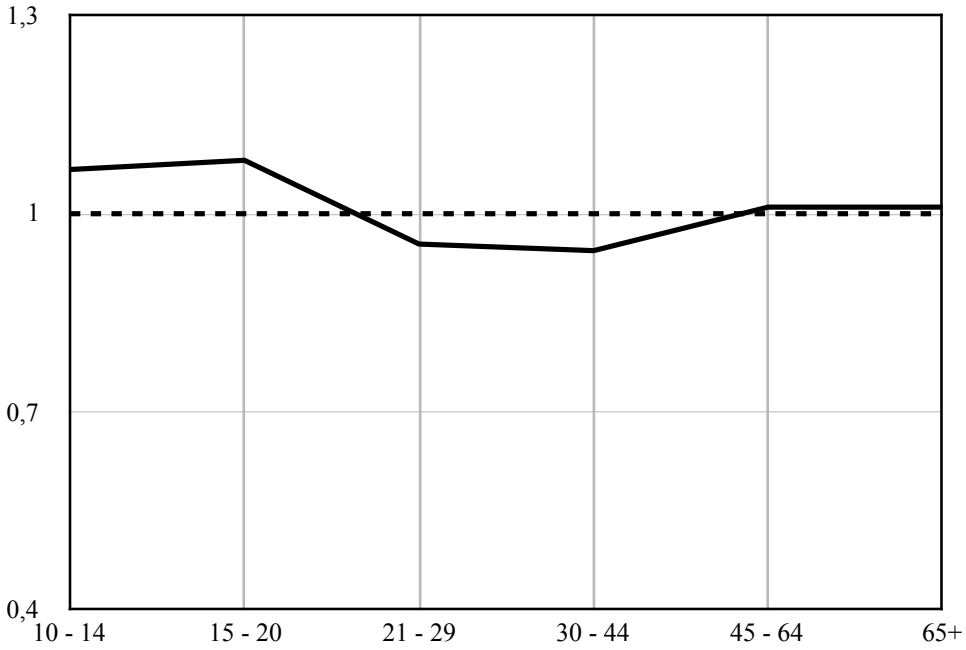
Category 3: Industries working vegetable or animal products other than textiles.



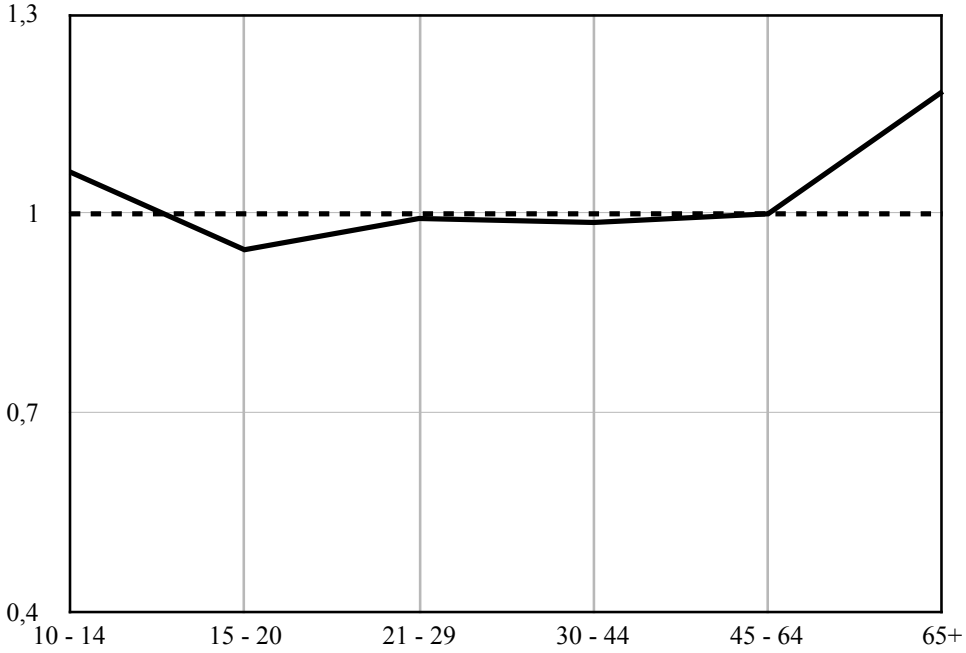
Category 4: Metalmaking and engineering



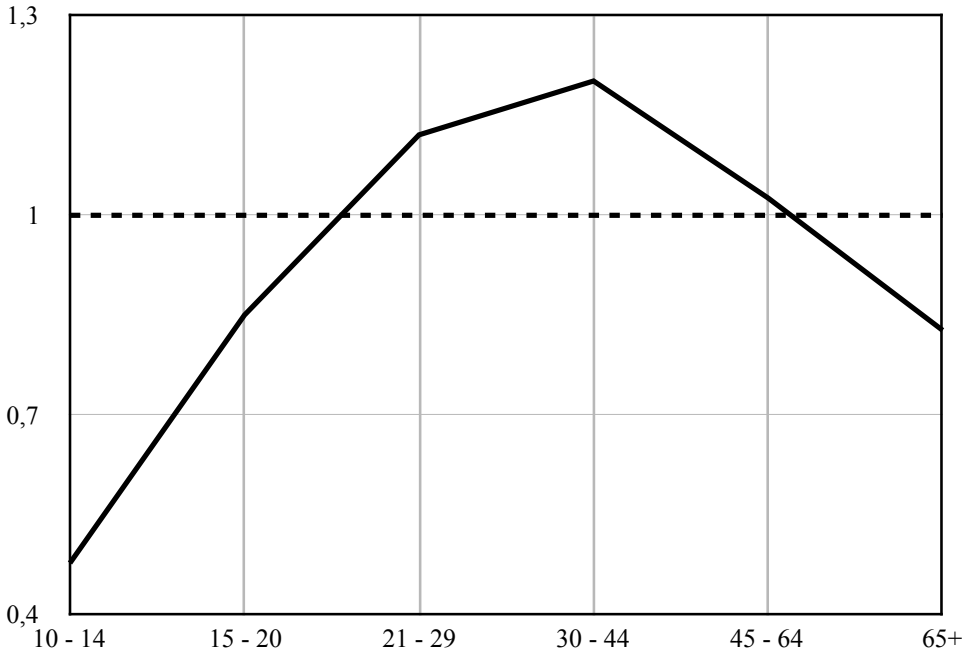
Category 5: Non-metallic mineral products, construction



Category 6: Textiles



Category 7: Chemicals



Category 8.1-8.2: Printing and publishing, utilities

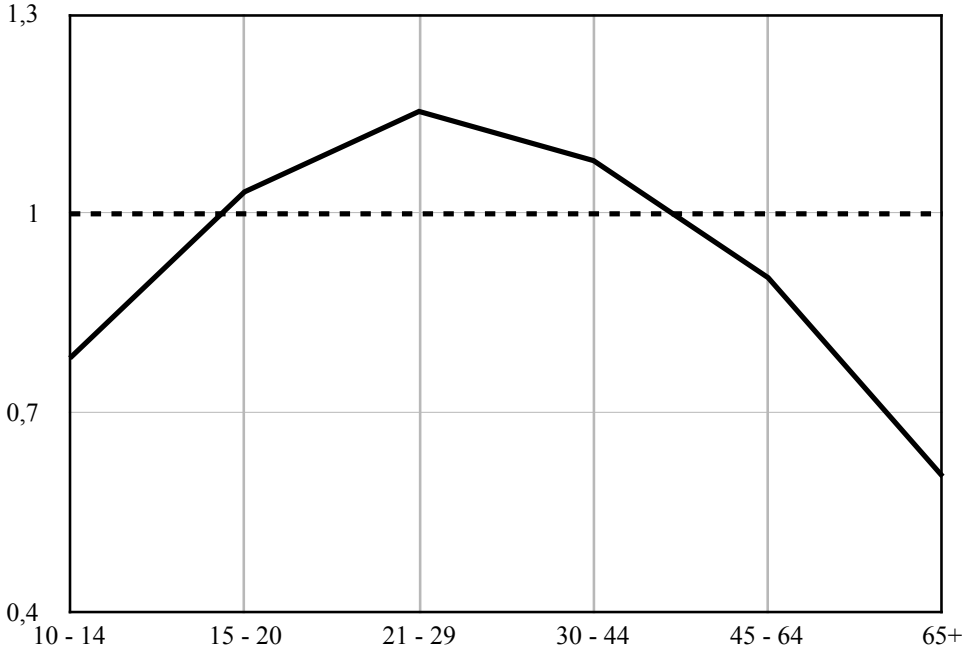


Figure 6 - Relative age structure, category 4, two-digit industries.